Sigma’s 29th International Nursing Research Congress

Participation in Virtual Clinical Simulation: An Assessment of the Impact on Content Mastery for Students

Laura L. King, DNP, RN, CNE  
School of Nursing, The University of Texas Medical Branch at Galveston, Galveston, TX, USA  
Kelli J. Greder, PhD, MSN, RN  
American Sentinel University, Aurora, CO, USA  
Kadriyya Clark, RN, DNP, CNE  
Department of Nursing, American Sentinel University, York, PA, USA

Purpose: The purpose of this poster presentation is to disseminate key findings from the project regarding the impact of participation in virtual clinical simulation learning on content mastery of concepts taught in a maternal newborn course to third semester baccalaureate nursing students.

Target Audience: The target audience is nurse educators, administrators, and students.

Abstract

Purpose: The nursing shortage has resulted in an increased number of students enrolled in nursing programs throughout the United States. The increased number of students entering baccalaureate nursing education programs has led to various problems associated with this growth, including the limitation of clinical learning sites and overcrowding in simulation center learning. In addition, due to the acuity level of hospitalized patients, student require a safe environment in which to learn, one in which they can make mistakes without causing harm to real patients. One creative alternative for this problem involves the use of virtual clinical simulation. Clinical simulation is considered to be an active learning strategy. Active learning strategies engage adult learners in the learning process (Benner, et al., 2010). In addition, participation in virtual clinical simulation has been studied and is considered to have demonstrated effectiveness on the development of self-confidence and self-efficacy in nursing students (Heinrich, et al., 2012; Kilmon, et al., 2010; Shin, et al., 2014). However, few studies have looked at the impact of participation in this type of learning strategy upon course content mastery (Bourke & Ihrke, 2012). This project looked to compare content mastery exam scores of students participating in a virtual clinical simulation with those of students who had not participated in order to assess the impact of the learning strategy.

Methods: Institutional Review Board (IRB) approval was sought and obtained prior to collection of study data. In order to protect student privacy a research proxy was utilized to de-identify student exam scores. Utilizing a retrospective, quantitative, nonexperimental approach to analyze data consisting of Assessment Technologies Institute (ATI) Content Mastery Series (CMS) Maternal Child exam scores of nonequivalent and non-concurrent cohorts, this project compared a total of (N=235) scores to determine if a difference existed between subjects who participated in a virtual clinical simulation learning program with those who participated in a different type of active learning strategy.

Results: The data sample used for this project was that of one of convenience. This consisted of all students who were enrolled in a maternal child nursing course, but who were not repeating the course, in either the fall, 2015 academic semester, or the summer, 2016 academic semester. The study was conducted in a traditional nursing education program located within a university which is a part of a large academic health center in the southwest region of the United States. A total of 236 students were enrolled between the two semesters, and 235 student exam scores were analyzed as one student was repeating the course in the fall, 2015 semester. Students from the summer, 2016 cohort (N= 129) slightly outnumbered those from the fall, 2015 semester (N= 106). The highest number of students (N= 198), were in the 17-25-year age group, with the lowest number (N= 3) in the 36-40-year age group. For ethnicity, the highest number of students (N= 124), were white, while the lowest number of students (N=
were Black/African American. Data analysis using the Mann-Whitney U test found that while there was a positive significant difference between student cohort ATI™ CMS scores, it was in favor of the cohort that did not participate in the virtual simulation learning experience; therefore no cognitive gain was demonstrated relating to participation in the virtual learning strategy.

**Conclusion:** Based on the results of this project, participation in virtual learning assignments by maternal child nursing students enrolled in a traditional baccalaureate nursing program at a large state university, did not impact ATI™ content mastery exam scores in a positive manner. The implications of the results from this project are important for nursing educators. The findings of this project demonstrated that student group participation in the virtual clinical simulation did not produce an increase in course content mastery as evidenced on the ATI CMS exam scores, therefore the implication is that virtual learning environments may not be the best learning strategy to promote content mastery as compared with the use of case studies. However, much of the literature found in review for this project related to student satisfaction with participation in virtual learning scenarios, and the development of confidence from participation in this type of learning activity. It is important for nursing educators to consider these implications when trying to decide on simulation methods to use when educating students based on the need to establish content mastery, or to promote confidence and self-efficacy. Dissemination of this information from this project can add to the body of knowledge pertaining to effective learning methods to promote concept mastery, and those, which may not be as effective.

**Title:** Participation in Virtual Clinical Simulation: An Assessment of the Impact on Content Mastery for Students

**Keywords:** content mastery, learning and virtual

**References:**


**Abstract Summary:**
As a result of the limited clinical learning sites needed for educational purposes, this project looked to compare content mastery exam scores of BSN students to determine if a difference exist between students who participated in a virtual clinical simulation learning program with those who did not participate.

**Content Outline:**
I. Introduction
A. Statement of the background of the problem including traditional teaching methods, increased student enrollment, limited time available in simulation lab, the need to learn in a safe environment, and the limited number of clinical learning sites.

B. Describe how simulation, including virtual simulation, has been used as a valuable tool for students to engage students in active learning.

II. Body

A. The research question was “does participation in virtual clinical simulation assignments impact content mastery exam scores of BSN students?”

1. Describe the scope and limitations of the study:

a) The population in the study, participation in virtual assignment versus participation in case study assignment, and the content mastery exam scores.

b) Limitations included were that this was a nonrandom sample, and it was a single site study.

2. Discuss the findings of the literature review:

a) Simulation provides a safe learning environment

b) The need for active learning strategies

c) The relative unknown impact of virtual simulation on the development of course content mastery

B. Methods used

1. Project design and the instrument used:

a) Comparative design using retrospective data and nonequivalent cohorts

b) ATI™ Content Mastery Maternal-Child exam

c) Identified variables including independent, dependent, virtual patient assignment, and demographic.

2. Discuss data collection:

a) IRB approval obtained from both institutions

b) Use of a research proxy to protect student identities

3. Data analysis and management

a) Mann-Whitney was test used related to abnormal distribution of data.

C. Outcomes

1. Results:
a) Present table describing population sample and setting

b) Present and describe the table representing the scores by the VCE™ group

c) Present and describe the total ATI™ scores by age group

d) Summarize the meaning of the results – participation did not increase content mastery although studies support the use of virtual simulation to promote self-confidence and self-efficacy.

2. Implications for educators:

a) The goal for the use of simulation must be carefully determined by educators prior to selecting the learning strategy, virtual simulation may not be best to promote content mastery.

b) Other active learning methods such as case studies may be better suited to promote content mastery.

c) Group participation in virtual learning assignments may impede learning.

III. Conclusion

A. Based on the results of this project, participation in virtual learning assignments by maternal child nursing students enrolled in a traditional baccalaureate nursing program at a large state university, did not impact ATI™ content mastery exam scores in a positive manner.

B. Possible future studies including a more detailed comparison specific to the use of virtual simulation versus case studies, and group participation for the virtual learning compared with single-student learning. Also the need to evaluate the NCLEX-Rn pass rates for students participating in virtual learning versus other active strategies.

First Primary Presenting Author

**Primary Presenting Author**
Laura L. King, DNP, RN, CNE
The University of Texas Medical Branch at Galveston
School of Nursing
Assistant Professor
Galveston TX
USA

**Professional Experience:** 1993-present--Registered Nurse, Houston, Texas 2015-2017-- DNP Student, American Sentinel University, Aurora, CO 2013-present-- Assistant Professor, The University of Texas Medical Branch at Galveston School of Nursing, Galveston, Texas

**Author Summary:** Dr. King has been an educator in the BSN program at UTMB School of Nursing since 2013. She specializes in pediatric nursing. She completed her DNP in Educational Leadership from the American Sentinel University in August of 2017. Her DNP scholarly project was entitled "Participation in Virtual Clinical Excursions (VCEs): An Assessment of the Impact on Content Mastery Exam Scores of Nursing Students" on which this presentation is based.

Second Author
Kelli J. Greder, PhD, MSN, RN
American Sentinel University
Chair RN-BSN, MSN, and General Education programs
Aurora CO
USA
Professional Experience: Dr. Kelli Greder is Chair, RN-BSN, MSN, and General Education Programs at American Sentinel University. Prior to this role she had been teaching at American Sentinel University in the MSN and DNP programs, and in the RN-BSN program before that. Dr. Greder has held various leadership and education roles over the past 20 years, and direct care nursing positions prior to that. She is a member of Sigma Theta Tau International, American Nurses Association, Minnesota Organization of Registered Nurses, and the National League for Nursing. Dr. Greder holds a PhD in Education from Capella University, MSN in Nursing Education from the University of Minnesota, BSN from Metropolitan State University, St. Paul, MN and ASN from Lakewood Community College (now known as Century), White Bear Lake, MN.

Author Summary: Dr. Kelli Greder is Chair, RN-BSN, MSN, and General Education Programs at American Sentinel University. Dr. Greder has held various leadership and education roles over the past 20 years, and direct care nursing positions prior to that. She is a member of Sigma Theta Tau International Zeta and Chi Alpha chapters. Dr. Greder holds a PhD in Education from Capella University.

Third Author
Kadriyya Clark, RN, DNP, CNE
American Sentinel University
Department of Nursing
Adjunct Professor
York PA
USA

Professional Experience: Associate Professor at Community College of Baltimore County. I teach professional practice courses. I have been a DNP chair and committee member for more than ten DNP students.

Author Summary: Associate Professor at Community College of Baltimore County. I teach professional practice courses. I have been a DNP chair and committee member for more than ten DNP students.